Securing Intermodal Connections:
Meeting the Challenges of Rail-Aviation Passenger Facilities

Prepared for:

Facility Security: Protecting Infrastructure and Special Events
Jane's Information Group
September 11 and 12, 2001
Salt Lake City, Utah

Prepared by:

Annabelle Boyd and Jim Caton
BCG Transportation Group, Inc.
1758 Worth Park, Suite 200
Charlottesville, VA 22911
Phone: (804) 973-9887
Fax: (804) 973-9930
www.bcgtrans.com

Executive Summary

In the coming decades, linking aviation and rail transportation systems together into a more efficient and seamless intermodal system will not only be a convenience, but a necessity. This paper:

- Describes the trends driving rail-aviation links to the forefront of urban planning strategies

- Highlights the special challenges that these linkages present for security management within the Federal Aviation Administration's (FAA) national planning framework

- Offers recommendations for intermodal facility design and management.

DEMAND FOR INTERMODAL SERVICE. With the advent of unprecedented growth in air travel, airports worldwide are challenged to match their "landside" capacity with that of the "airside," and to do so in innovative, effective, attractive and economically feasible ways. For the first time, airports with terminals, parking, and roadway access at or near capacity, are struggling with the impacts of "landside" limitations on their "airside" passenger operations. To ensure convenient ground access to and from the airport, at some airports, "landside" improvements have taken on the same level of importance as "airside" improvements.

Enter the rail-aviation intermodal passenger facility. These stations – whether bringing passengers from light rail, heavy rail, commuter rail, automated guideway, or from multiple modes into the airport – have become a central strategic solution used by transportation engineers to support long-term plans for achieving sustainable increases in "airside" volume while maintaining existing airport boundaries and terminal operations. Rail-aviation passenger stations – even if they only achieve a 4 percent share of passenger travel to the airport – can make the difference between flowing traffic on airport access roads and gridlock.

Currently, there are more than 120 airports worldwide considering rail links to connect their facilities with the greater metropolitan region. In the United States, 10 airport-rail links are in the engineering or construction phases, and will be complete by the decade's end. Ten more projects are in the planning stages, most of which will be underway by 2010. By the end of the decade, 8 of the nation's top 10 airports (and 20 of the nation's top 30 airports) will be served by rail transit agencies. Approximately 70 percent of all U.S. air passengers will depart from these airports.

SECURITY CONSIDERATIONS. Aviation expansion and partnership with other modes of transportation is beneficial for the economy and the transportation industry as a whole, but it creates challenges from a security perspective. While rail-air interconnectivity improves operational efficiencies at an airport, it may also increase the attractiveness of the airport as a target for terrorism, and expose the airport to new vulnerabilities introduced with the rail station.

One of the FAA's toughest tasks is to provide a safe and secure environment for the more than 640 million annual passengers that fly on 97 U.S. air carriers at 506 major airports. Those passengers pass through approximately 1,000 screening checkpoints and take more than 2.5 billion carry-on and checked bags annually. A decade from now, those figures will increase to around 1 billion passengers with almost 3.5 billion total bags.

According to the Federal Bureau of Investigation (FBI), it is highly likely that a terrorist attack will be directed against a U.S. airline, aircraft, airport, or passenger terminal in the next decade. Explosive devices, smuggled aboard planes in baggage or as part of on-board equipment or catering, remain the biggest threat to the aviation system. The FBI also views hijackings, shoulder-fired missiles, and the use of chemical, biological and nuclear weapons as significant threats that must be addressed. To date, the U.S. Intelligence Community is tracking more than 100 groups identified as having the capabilities to target U.S. aircraft, airports, and rail transit agencies.

To meet these threats, and to address congressional mandates, FAA has taken the lead in developing security requirements for all facilities within airport property, including airside operations, landside access, and passenger terminals. In this role, since 1996, FAA has continued on-going implementation of recommendations from the *White House Commission on Aviation Safety and Security*, as well as U.S. Department of Transportation policies developed in response to *Presidential Decision Directives (PDD) 62 and 63*.

On July 17, 2001, with publication in the *Federal Register* updating 14 CFR Parts 107, 108 and 139, FAA initiated its most ambitious security program yet. These revised Rules, which apply to airports serving aircraft with more than 60 seats, clearly define the areas of the airport in which security is the most critical and specify detailed requirements for access control, security identification and display areas and procedures, background checks on employees, and formal and documented security programs, certifications, and plans.

Airport operators and tenants, including rail transit agencies serving the airport, are required by the new rules to have a security program approved by the FAA Administrator that specifies measures they will use to perform their regulatory and statutory responsibilities. Airports and tenants will be held accountable for implementation of these measures through a rigorous inspection and enforcement program managed by FAA. Not only can FAA fine airports and tenants for failure to comply with security requirements, but individual employees are now directly accountable for non-compliance with certain regulations and can also be fined.

To fulfill FAA security requirements, as well as to address its own unique vulnerabilities, the rail transit agency serving the airport must develop a security program for the intermodal facility. Previous experience demonstrates that a dedicated security function, with the technical capabilities and resources to interface with planners, engineers, vendors, contractors, and airport and FAA personnel, most effectively manages this process during station planning, design and construction.

RAIL AGENCY RESPONSIBILITIES. To effectively address not only FAA requirements but also global security concerns at the rail transit station, the dedicated security function should work with the Airport Security Consortia (established at all major U.S. airports) to ensure performance of a formal risk assessment during planning, design and construction. The risk assessment should effectively identify vulnerabilities at the rail-aviation passenger terminal and recommend security features, equipment, and procedures to resolve and control identified vulnerabilities. Recommendations from the risk assessment will be used to guide security specifications for meeting FAA requirements, strengthening emergency response features, and contributing to the development of a set of design criteria governing the rail agency's access to the airport. Recommendations from the risk assessment will likely address the following elements of security control, each of which is discussed in this paper:

- Electronic Access Control Systems
- Closed Circuit Television
- Procedural Access Control
- Contingency Planning
- Design and Operation to Manage Criminal Activity
- Baggage Check-in Facilities
- On-going Threat and Vulnerability Management Program
- Coordination and Partnership for Emergency Response.

Rail agency activities and controls developed to address security must be documented in a formal program and plan, approved by the rail transit agency, the airport, and the FAA.

Securing Intermodal Connections: Meeting the Challenges of Rail-Aviation Passenger Facilities

In the coming decades, linking aviation and rail transportation systems together into a more efficient and seamless intermodal system will not only be a convenience, but a necessity. To promote awareness regarding the unique considerations that must be addressed to design, engineer and operate these connections, this paper:

- Describes the trends driving rail-aviation links to the forefront of urban planning strategies (PART I),

- Highlights the special challenges that these linkages present for security management (PART II), and

- Offers recommendations for rail-aviation intermodal facility design and management (PART III).

To support this discussion of trends, challenges, and requirements, this paper draws on several references and resources, including the following:

- Federal Aviation Administration -- *Final Rule*, 14 CFR Parts 107 and 139, Airport Security (July 17, 2001)
- Federal Aviation Administration -- *Final Rule* 14 CFR Part 108, Aircraft Operator Security (July 17, 2001)
- Federal Aviation Administration – *Advisory Circular*, 14 CFR Part 107
- Transportation Research Board, *Report 62 -- Improving Public Transportation Access to Large Airports, National Academy Press*, Washington, D.C., 2000
- Bureau of Transportation Statistics, *Annual Report Data for 2000*
- Federal Transit Administration, *Annual Report -- New Starts Funding Program, 2000*
- Federal Transit Administration, *State Safety Oversight Program, Annual Report for 2000*
- *Airport Ground Access Planning Guide*, Federal Highway Administration, Intermodal Division, Washington, D.C., 1997.

PART I – Trends Supporting Intermodal Connections to the U.S. Aviation System

The civil aviation system in the United States is by far the largest and most complex in the world:

- There are more airports in the United States than in the rest of the world combined --
    - 655 FAA-certificated airports that serve air-carrier operations with aircraft seating more than 30 passengers;
    - This system is supported by approximately 18,000 public and private use airports designed to serve small aircraft, helicopters, and the military
- 14 of the world's 20 busiest airports are in the United States
- 40 percent of all passengers enplaned in the world board at a U.S. airport.
- The forecasted rate of growth for domestic and international travel provided by U.S. air lines is between 5 and 6 percent per year for the next decade
- Airline travel remains the safest mode of travel, with a total accident rate of .029 events per 100 million aircraft-miles or .45 events per 100,000 aircraft departures

The domestic aviation system is not only extensive but also highly concentrated and efficient. The hub and spoke system of flights converging on a central connection point dominates flight scheduling:

- 98 percent of all U.S. passengers pass through one of the 50 busiest hubs
- Scheduled connection time at these hubs may be as few as 20 minutes

Airports make major contributions to their local, state and regional economies. A study performed a decade ago by Wilbur Smith Associates determined that:

- One in every 15 people employed in the U.S. owes his or her job to civil aviation
- Jobs directly attributable to U.S. airports are estimated at 2.3 million
- Total jobs attributable to U.S. airports are estimated at 7.6 million
- Between 6 and 7 percent of the nation's GNP is attributed to civil aviation

More recent assessments performed last year by the U.S. Department of Commerce's Regional Input-Output Modeling System confirm the Wilbur Smith findings, and further indicate that:

- Each dollar spent by aviation and/or aviation-dependent businesses generates an additional $1.52 in economic activity.
- Airport jobs are desirable, and the average airport wage was 40 percent higher than the average State salary.
- For every job at the airport, nearly three are created in the visitor-related economy.
- Aviation-related businesses and their employees annually contribute $5 billion in local taxes
- Aviation facilities attract new industry and their absence or poor performance detracts from the attractiveness of a State to the business community

- Many visitors arriving by air spend about $70 per day in their arrival location

Airport capital improvement projects also have a highly beneficial impact on the economy. The U.S. Department of Commerce has determined that *airport construction projects* are particularly beneficial because dollars spent by state and local governments are highly leveraged with federal and private funds. The multiplier effects of construction spending are especially strong because each dollar spent on construction generates an additional $2 in economic activity. Together these two factors mean that airport development projects produce an impact on the State's economy that is more than 25 times the amount contributed by State and local funds. (U.S. Department of Commerce, *Benefits of Airports for State and Local Economies*, 2000)

Emerging Intermodalism

Early in aviation history, airports were usually located in isolated areas, remote from the activities of urban life. However, increasing urban expansion since the 1960s, combined with exponentially increasing passenger and freight air traffic, have encouraged connectivity between airports and other modes of transportation. Many airports have now become intermodal – serving a variety of freight transportation modes (railroad, truck, and maritime) and expanding to include passenger transportation (heavy, light, and commuter rail and bus).

Intermodalism is generally defined as the concept of transporting passengers and freight in such a way that all the parts of the transportation process, including information exchange, are efficiently connected and coordinated, offering the end user with greater flexibility and service. For freight transportation, an intermodal system is one that moves and tracks a shipment using several different modes of transportation on a single bill of lading, to meet customer needs for price or just-in-time delivery.

Likewise, for passenger transportation, an intermodal system *allows a passenger to travel from one location to another, moving seamlessly between transportation modes on the same ticket, with the trip tailored to meet the passenger's needs for travel information, cost, scheduling, comfort, and other considerations*. Intermodal systems, by their very nature, should assure the most efficient, least expensive means available for movement from location to another.

The *Intermodal Surface Transportation Efficiency Act of 1991* (ISTEA) placed considerable emphasis on the planning, design, and construction of intermodal facilities and connections. Since 1991, intermodal efforts have focused primarily on the shipment of goods among several modes, greatly improving connectivity among water, air, rail and trucking shipping facilities and services. Passenger intermodalism, while remaining a national priority advocated by the U.S. Department of Transportation, has not received the same level of attention.

In 1994, the National Commission on Intermodal Transportation performed a "complete investigation and study of intermodal transportation in the United States." According to the Commission's Final Report that September:

> "Intermodalism describes an approach to planning, building, and operating the transportation system that emphasizes optimal utilization of transportation resources and connections between modes. From the perspective of the user – the traveler or shipper of

goods – the mode is irrelevant; what matters is the quality, cost, timeliness, and safety of the trip."

The Commission's report points out that intermodal growth "has been explosive" but that physical bottlenecks and a lack of institutional coordination have prevented further progress, particularly in the development of effective intermodal passenger terminals.

This situation is changing, however. While passenger intermodalism in the United States still lags behind Europe, astounding growth in air passenger traffic is creating demand for better and more integrated ways to bring passengers, employees, and visitors (and their baggage) to the airport.

Key Driver for Intermodal Development: Growth in Air Travel

In 2000, U.S. air carriers provided 685 million enplanements, which translates into approximately 1.5 billion individual passenger trips[1]. That number has risen from 500 million enplanements (1.1 billion passenger trips) in 1995, and is expected to climb to over 1 billion enplanements (over 2 billion individual passenger trips) by 2010. In addition, the U.S. aviation network managed more than 1.5 billion carry-on bags and 1 billion checked bags in 2000. By 2010, this number is expected to rise to 2 billion carry-on bags and 1.5 billion checked bags. (The Table on the next page identifies the nation's Top 30 Airports in terms of total passenger trips for 2000.)

In spite of the sustained 5 percent growth rate each year over the next decade, the number of airports certified by the FAA to sustain air carrier service for aircraft carrying 31 or more passengers is expected to remain unchanged over the next decade (655), and less than 20 new runways will be constructed.

Instead, to meet rising demand for air travel, the Federal Aviation Administration (FAA), airports, air lines, and the aviation industry are working together to implement ambitious and sophisticated programs to obtain additional capacity from ***existing resources and equipment***. Planned activities over the next decade include:

- The re-configuring of airport operations, schedules, and playbooks using advanced systems management principles
- Renovations, upgrades and overhauls at existing terminals and facilities
- New alignments and configurations for existing runways and ground support logistical systems
- Introduction of new aircraft by 2005, the largest of which can seat as many as 550 passengers

[1] *Enplanements capture departing passengers only. Total passenger trip count equals the sum of arriving + departing + direct transit passengers, counted once.*

RANK	AIRPORT	CODE	TOTAL PASSENGERS	% CHANGE
1	HARTSFIELD ATLANTA INTL	ATL	80,162,407	2.7%
2	O'HARE INTL	ORD	72,144,244	-0.6%
3	LOS ANGELES INTL	LAX	66,424,767	4.8%
4	DALLAS/FT WORTH INTL	DFW	60,687,122	1.1%
5	SAN FRANCISCO INTL	SFO	41,040,995	1.8%
6	DENVER INTL	DEN	38,751,687	1.9%
7	MCCARRAN INTL	LAS	36,865,866	9.0%
8	MINNEAPOLIS/ST PAUL INTL	MSP	36,751,632	5.8%
9	PHOENIX SKY HARBOR INTL	PHX	36,040,469	7.4%
10	DETROIT METRO WAYNE COUNTY	DTW	35,535,080	4.6%
11	G BUSH INTERCONTINENTAL	IAH	35,251,372	6.7%
12	NEWARK INTL	EWR	34,188,468	1.7%
13	MIAMI INTL	MIA	33,621,273	-0.8%
14	JF KENNEDY INTL	JFK	32,856,220	3.7%
15	ORLANDO INTL	MCO	30,823,509	5.6%
16	LAMBERT-ST LOUIS INTL	STL	30,561,387	1.2%
17	LESTER B. PEARSON INTL	YYZ	28,930,036	4.1%
18	SEATTLE TACOMA INTL	SEA	28,408,553	2.5%
19	LOGAN INTL	BOS	27,412,926	1.3%
20	LA GUARDIA	LGA	25,374,866	6.5%
21	PHILADELPHIA INTL	PHL	24,918,276	4.7%
22	CHARLOTTE/DOUGLAS INTL	CLT	23,073,894	7.6%
23	HONOLULU INTL	HNL	23,016,542	2.0%

24	CINCINNATI/NO KENTUCKY INTL	CVG	22,537,525	3.5%
25	WASHINGTON DULLES INTL	IAD	19,971,260	1.6%
26	SALT LAKE CITY INTL	SLC	19,900,810	-0.2%
27	PITTSBURGH INTL	PIT	19,816,511	5.5%
28	BALTIMORE/WASHINGTON INTL	BWI	19,602,609	12.4%
29	VANCOUVER INTL	YVR	16,247,288	1.7%
30	TAMPA INTL	TPA	16,043,383	6.1%

Top 30 Airports – 2000 Individual Passenger Air Trips

- Implementation of advanced intrusion detection technology and "intelligent" navigational systems to provide additional capacity in available airspace

- Sustaining improvements in materials and pavement management to enhance the performance of runways and ground support facilities.

To support this activity, FAA will invest a minimum of $2.5 billion each year over the next decade in the Airport Improvement Program (AIP), financing eligible local projects. These funds are in addition to the more than $10 billion spent annually for FAA operations and maintenance, facilities and equipment, and research, engineering and development.

Keeping Pace: Landside Access versus Airside Capacity

With the advent of unprecedented growth in air travel, airports worldwide are challenged to match their "landside" capacity with that of the "airside," and to do so in innovative, effective, attractive and economically feasible ways. For the first time, airports with terminals, parking, and roadway access at or near capacity, are struggling with the impacts of "landside" limitations on their "airside" passenger operations. To ensure convenient ground access to and from the airport, at some airports, "landside" improvements have taken on the same level of importance as "airside" improvements.

Enter the ***rail-aviation intermodal passenger facility***. These stations – whether bringing passengers from light rail, heavy rail, commuter rail, automated guideway, or from multiple modes into the airport – have become a central strategic solution employed by transportation planners to support long-term plans for achieving sustainable increases in "airside" volume approaching 15 percent while maintaining existing airport boundaries and terminal operations.

Intermodal stations – even if they only achieve a 4 percent share of airport passenger traffic to the airport – still can make the difference between efficient airport operations and gridlock. Over the last decade, roadway access – particularly in the large metropolitan centers on the East and West Coast – has become unreliable. In some cities, such as New York, Boston, Los Angeles, and San Francisco, it can take anywhere from 45 minutes to two hours to get to the airport from

central downtown and suburban locations by automobile. Surveys conducted by local business organizations in these areas consistently find that lack of efficient airport access is a commonly cited reason for businesses relocating away from major East Coast cities to the South and West. Air quality concerns are also encouraging these linkages. Most of the top 50 U.S. airports are located in "non-attainment areas" under the federal Clean Air Act. Intermodal transportation systems, by removing 2 to 3 thousand cars from airport access roads each day, will reduce pollution and the resources required to maintain the vehicle access system.

Intermodal Station Characteristics

To achieve sufficient reductions in congestion and promote efficient landside operations, rail terminals serving airports must achieve a significant share of daily travelers – including passengers, employees, and greeters. Depending on the size of the airport and the number of employees and daily departures, ideal ridership for an intermodal station serving a large airport with 6 million annual originating passengers, and over 20,000 airport employees, should range from 5,000 to 10,000 daily passengers or a 5 percent rail mode share.

This share is low when compared to European systems (15 to 30 percent rail mode shares are standard, but car ownership percentages and roadway capacity are much lower in Europe). However, the central issue for U.S. intermodal stations is not their ability to replace automobile service. Instead, it is their capacity to manage ***enough*** passenger load to prevent or reduce gridlock, to work around the margins to sustain roadway traffic flows and to provide important "fall back" resources in the event that primary road access is limited due to a natural disaster, accident, or security alert.

Rail service will not replace automobile access; however, a well-designed station and service, such as the WMATA-Reagan Washington National station or the BART-SFO station currently under construction in San Francisco, may see the rail mode share rise to 10, 15 or even 20 percent.

Current rail mode shares for major U.S. airports with rail access are provided in the Table on the next page. Newly constructed stations will have benefits over older ones, and most transportation planners expect mode shares for these stations to approach 7 percent. At this level, aggressive promotion with employees and short-term business travelers could increase rail service to a 10 percent mode share for a brief period of time, in response to specified need. To meet planning objectives, the intermodal rail transit station must address passenger and employee concerns for reliability, convenience, access and service locations.

As indicated on the Table, originating air travelers and airport employees are the two most important groups to consider for ground access purposes, because they account for the majority of person trips to and from the airport. In some cases, the needs of these two groups for services are different. For example, airport workers do not keep "9 to 5" commuting schedule and therefore require additional transportation service in the early morning and late night hours. These workers may not be heading for the main airport terminal, but for satellite terminals which support maintenance, cargo sorting and management, or parking and ground support services. Air travel passengers, on the other hand, may have baggage, and may be more likely than other transit users to have children with them. In these instances, air travelers need close and convenient access to airline counters or baggage check-in facilities. However, it is the commonalities of the air travelers' and airport employees' trips to the airport where the most significant markets for rail ground access services can be found.

Rail Mode Share – Existing Rail-Aviation Connections				
Airport	***Enplaned Passengers***	***Originating Passengers***	***Average Daily Employees***	***Rail Mode Share***
Airport Rail Mode Share – Direct Access				
Washington National	8,000,000	6,500,000	n.a.	16%
Chicago Midway	5,400,000	4,490,000	n.a.	7.7%
Chicago O'Hare	36,000,000	16,130,000	40,000	4.2%
Atlanta	37,000,000	14,172,000	n.a.	7.9%
Baltimore	7,500,000	6,500,000		2.6%
Cleveland	6,200,000	4,200,000	n.a.	2.8%
Philadelphia	12,000,000	7,000,000	n.a.	2.0%
St. Louis	14,000,000	5,400,000	19,000	3.3%
Airport Rail Mode Share – Shuttle Buses from Rail Link				
Boston	13,000,000	10,400,000	14,500	5.7%
Los Angeles	31,000,000	18,300,000	40,000	.5%
NY-Kennedy	16,000,000	6,200,000	41,000	7.9%
Miami	17,000,000	7,420,000	n.a.	1.2%
Oakland	4,600,000	4,200,000	10,500	4.1%

n.a. = not available

The technical characteristics of both existing urban rail and light rail technologies and proposed advanced transit systems have been described in numerous publications. Airport rail systems that attract the highest percentage of airport passengers and employees appear to have the following common characteristics:

- Direct Service - Rail services that allow passengers to travel between the airport and major activity centers (e.g.,the commercial business district [CBD], tourist attractions, convention centers and businesses) without making transfers, or incurring numerous stops.

- Frequent Service - Rail services that minimize passenger waiting times by providing headway of 10 minutes or less during peak periods, thereby reducing travel times and enhancing the convenience of the system.

- Extensive Regional Coverage - Airport rail systems that are part of a comprehensive network of rail service and feeder buses provide an attractive alternative to a greater number of potential passengers than systems that consist of a single line (e.g., between the airport and the CBD).

- Available Parking - Residents, wishing to park at rail stations away from the airport and use rail as their airport access mode, will be influenced by the availability of parking at non-airport stations. The operators of some commuter rail systems prohibit overnight parking in order to increase parking availability for typical non-Airport commuters.

- Through Service - Routes that continue past the airport will likely support more frequent service and attract more ridership than routes that terminate at the airport.

Airport rail stations that have attracted the highest percentage of airport passengers and employees appear to have the following common characteristics:

- The station is located within convenient walking distance of the terminal. - Ideally the rail station is:

Located within 500 feet of the terminal building, thereby avoiding the need for passengers to ride a shuttle bus or transfer to a people mover system to access the terminal building. Newer design guidelines recommend a distance of no more than 300 feet between the nose of the train and a baggage check-in facility.
Designed to minimize (or avoid) the need for passengers to change levels, climb stairs, or use an escalator. Grade- separated paths between the terminal building and rail station should, however, be provided to eliminate the need for passengers to cross roadways. Grade-separated paths enhance passenger safety and eliminate impacts on roadway operations.
Designed to accommodate passengers with baggage carts or suitcases with wheels.
Designed to comply with ADA requirements.
Located adjacent to the baggage claim areas, where passengers select from the available travel modes.

- Baggage handling is made easier - Ideally passengers are offered:

Porter service to assist in transporting baggage between the terminal and rail platform (or rail car).
Baggage trolleys that can accompany a passenger on the entire route between the baggage claim area and the rail platform, including on escalators or elevators (if required).
Baggage handling services that allow passengers to check their baggage to (or from) their ultimate destination directly on the rail platform. For example, the Swiss "Fly/Rail-Baggage" service allows passengers to check their bags at any of over 100 rail stations in Switzerland through to their final destination (i.e., avoiding the need to claim and recheck bags at the airport) or to check their bag at any Swissair airport ticket counter in any nation (or at those of certain other airlines) through to any of 100 Swiss rail stations.

- The station provides good information systems. – Good information systems include:

Clear signage and graphics, posted in highly visible locations at frequent intervals through out the terminal and rail station to facilitate passenger wayfinding.
Information describing fares, schedules, and best routes to popular destinations. This information should be presented simply and clearly (e.g., easily understood by persons who are unfamiliar with the rail system and the region).
Pathways that allow passengers to identify their destination and minimize their reliance on signs.
Airline flight information displays in the rail station, to assist rail passengers in finding the proper terminal building or concourse.
Staffed information booths to supplement available signs and computerized terminals.

- The station is designed to enhance passenger comfort and convenience. - Examples of desirable design features include:

Passenger amenities, such as telephones, benches, vending machines, and concession areas.
Passive and active security features (e.g., video or audio monitoring of platforms and station areas, well-lit corridors, visible elevators, roving security personnel).
Sheltered waiting areas, with heating and air conditioning.

In the United States, rail systems have been most successful at airports serving frequent travelers who have little or no baggage (e.g., passengers on shuttle flights), and where rail offers faster or more reliable travel times due to congestion on access routes or lack of parking at the airport. These travelers are the most knowledgeable about the cities they are visiting and the most attuned to the schedule and financial benefits of rail transit service.

This group of air travelers most closely resembles airport employees. Examples of desirable design features for airport employees as a group of potential users include:

Connections provided to the major employment centers on the airport (e.g., airline maintenance facilities or air cargo sortation facilitates)
Larger transit system serves areas and neighborhoods in which employees live, which are often in the opposite direction of downtown and require suburb-to-surburb service planning
Convenient transit service provided to the station at night and on weekends, as many airport employees do not work "traditional" hours
Information and signage campaigns to assure employees of the safety of travelling on public transportation during off-peak hours
The provision of low cost or free parking at rail stations for airport employees

Institutional Relationships to Improve Access

Perhaps no intermodal facility is more difficult to design, construct, and operate than a rail transit station that serves an airport. Over the past twenty years, city planners, engineers, architects, and transportation specialists have struggled with the challenges arising from this unique intermodal connection. Joint air/rail facilities are costly and complex to finance. They require strong political commitment, and may require considerable innovation on the part of those attempting to design and finance them. Numerous interagency coordination issues must also be resolved.

Rail stations serving airports must successfully meet the operational requirements of both modes while providing passengers with the appearance of "seamless" movement between the rail station and the airport. Intermodal stations at airports often have unique constraints regarding passenger loading and discharging areas, pedestrian walkways and waiting areas, restrooms, lounges, and housekeeping, ventilation and lighting, drop-off and pick-up facilities, employee parking and equipment storage areas, fare collection, aesthetics, and traveler information.

While in operation, rail/aviation interfaces must address difficult jurisdictional issues, including the coordination of responsibilities between rail transit police/security and operations personnel, airport police, FAA representatives, U.S. Customs officers, Drug Enforcement Administration (DEA) agents, Immigration and Naturalization Service (INS) personnel, and Federal Bureau of Investigation (FBI) agents. In addition, each airline has its own security and operational staff. The interplay of these agencies – each with its own methods, philosophy, and goals – requires skillful planning and coordination. Cooperation is essential in tackling the problems encountered in the aviation environment.

Currently, there are more than 120 airports worldwide considering rail links to connect their facilities with the greater metropolitan region. In the United States, 10 airport-rail links are in the engineering or construction phases, and will be complete by the decade's end. Ten more projects are in the planning stages, most of which will be underway by that time. By the year 2010, 8 of

the nation's top 10 airports (and 20 of the nation's top 30 airports) will be served by rail transit agencies. Approximately 70 percent of all U.S. air passengers will depart from these airports.

The Table below identifies major airports served by rail transit agencies (heavy rail, light rail, and commuter rail). Some of these airports have rail service located directly on airport property; others have rail service located adjacent to airport property, which requires rail passengers to take shuttle buses to the airport terminals. Plans underway in the next decade are bringing rail transit passengers closer and closer to airport gates and terminals.

While ridership numbers fluctuate, and vary greatly among the rail transit agencies currently serving airports, it can be estimated that between 100,000 and 120,000 people use rail transit to access airports each day. In general, this number comprises between 5 and 10 percent of all passengers departing from the airport. With the planned extension of rail transit service to even more airports, this number could rise as high as 250,000 people each day by the year 2010, reaching a 7 percent mode share on average for rail service.

Each rail transit system that serves an airport has resolved a different set of design, operational, and jurisdictional issues. Cleveland RTA provided the first the rail/aviation interface. This station, which was operational before the FAA began regulating aviation security in 1972, was incorporated as part of the RTA's original design, and proceeded smoothly through construction and operation.

Chicago's CTA provides service to two airports (O'Hare and Midway). The CTA has developed strong working relationships with both airport authorities. During facility design, CTA was able to achieve a sufficient degree of separation between CTA facilities and airport restricted areas to limit the application of Federal Aviation Regulations and maintain a considerable degree of autonomy.

St. Louis Bi-State worked closely with Lambert Field to negotiate direct service to the airport. Metrolink's aerial station releases passengers near the major airport entrance. The ideal location of this station limits Metrolink's security requirements, while still providing passengers with close, convenient access to the airport. Today, the St. Louis light rail is attracting some 3,000 transit riders a day at its airport station, which translates to roughly a 5 percent mode share.

In July 1997, WMATA opened the new National Airport air terminal in Washington, D.C. The new terminal has been moved to a location immediately adjacent to the existing Washington Metro station, ending years of long walks and connecting buses. Serving about 16 million air passengers annually, with about 7 million originations from the ground transportation system, National Airport has proven to be the most successful airport rail transit project in the country, attracting approximately 16 percent of airline passengers.

	Airport	Agency	Type	Opening
Airports With Direct Rail Transit Access	Atlanta	MARTA	metro	1988
	Baltimore	MTA	light rail	1997
	Burbank	Amtrak Metrolink	intercity commuter	1990 1992
	Chicago O'Hare	CTA	metro	1984
	Chicago Midway	CTA	metro	1993
	Cleveland	RTA	metro	1968
	Philadelpia	SEPTA	commuter	1985
	St. Louis	MetroLink	light rail	1994
	South Bend	South Shore	commuter	1992
	Washington National	WMATA	metro	1977
Airports With Planned Rail Links*	Dallas-Fort Worth	DART	light rail	2010
	Newark	NJT Amtrak	commuter intercity	2001 (Sept.)
	New York Kennedy	PA	light rail	2002
	Phoenix	RPTA	light rail	2006
	Portland (Ore.)	Tri-Met	light rail	2001 (Sept. 10)
	Providence	Amtrak	intercity	2002
	San Francisco	BART	metro	2002
	Seattle-Tacoma	RTA	light rail	2009
	Washington Dulles	WMATA	metro	2010
	Miami	Tri-Rail/MDTA	light rail	2007
Airports With Bus Shuttles to Rail Line	Baltimore	Amtrak MARC	intercity commuter	
	Boston	MBTA	metro	
	Chicago O'Hare	Metra	commuter	
	Dallas-Fort Worth	TRE	commuter	
	Fort Lauderdale	Tri-Rail	commuter	
	Los Angeles	MTA	light rail	
	Miami	Tri-Rail	commuter	
	New York Kennedy	NYCTA	metro	
	Oakland	BART	metro	
	Palm Beach	Tri-Rail	commuter	
	San Francisco	Caltrain	commuter	
	San Jose/Santa Clara	VTA Caltrain	light rail commuter	

HR = Heavy Rail; IC = Intercity Rail; CR = Commuter Rail; LR = Light Rail

Existing and Planned Rail/Aviation Interfaces, 2000

On December 6, 1997, Maryland MTA opened its extension to BWI airport. The first rail/aviation interface conceived and designed after the passage of ISTEA, this station is part of a "Turn-Key" Demonstration Program, and has been designed to create a seamless transfer between rail and aviation transportation. Maryland MTA, like other transit agencies currently designing and constructing rail/aviation connections, must manage closer interaction with airport facilities, rules, and regulations.

Portland, Oregon has made mass transit a vital component of the region's transportation system and a viable alternative to the automobile. The Westside Hillsboro project -- a public/private partnership -- will extend the popular Portland MAX from downtown Portland to downtown Hillsboro via a three-mile tunnel through the West Hills and will connect to Portland's airport. This project is expected to be complete later this year.

Another important air-rail project is the Miami Intermodal Center (MIC) being developed to support Miami International Airport (MIA), one of the most congested airports in the nation. Since MIA has no space for an intermodal terminal within the airport, the MIC is being constructed a few miles to the east of MIA and will be connected via an automated people mover. When it is completed, the MIC will consist of two main facilities: the ***Rental Car Facility*** and the ***MIC Core.*** These facilities will provide a convenient centralized location for the public to access and transfer between multiple modes of transportation, including Tr-Rail Commuter Rail and Miami-Dade MetroRail. In addition, these facilities will relieve vehicular traffic congestion and increase terminal curb capacity at MIA. The MIC Core will feature all of MIA's "landside" support facilities and activities, including parking, baggage handling facilities, ticketing facilities, and terminal curb facilities; yet it is located to the east of MIA, connected via a proposed automated people mover system.

New York's Kennedy International Airport is now undergoing major renovations, including a $1.9 billion investment in rail -- known as AirTrain -- which will provide fast, reliable travel between Manhattan and JFK by 2002, connecting to New York City Transit (NYCT) and Long Island Rail Road (LIRR). This 8.1 mile system project – entirely funded by the FAA – is the most significant air-rail connection project in the nation, and may transport as many as 35,000 daily passengers. Other connection projects are underway at San Francisco International and Los Angeles' LAX airports.

It should also be noted that Houston, Orlando, Tampa, Salt Lake City, Denver, Charleston, Charlotte, Memphis and New Orleans all have airport connections in the early planning phases. Many of these projects may be in Preliminary Engineering by 2005.

PART II -- Security Issues for Rail Transit Intermodal Facilities

Rail/aviation interfaces present unique security challenges because two different modes, with two different levels of security and two different sets of security problems, must necessarily meet. In this intermingling of service, it is the airport that maintains ultimate control. As specified by FAA rulings, the airport authority must control all facilities within its jurisdiction. Therefore, the rail transit agency is a tenant to the airport, and must comply with all regulations and rules identified by the FAA and the airport. This relationship complicates security design and planning issues, and requires close coordination from all involved parties.

Aviation expansion and partnership with other modes of transportation is beneficial for the economy and the transportation industry as a whole, but it creates major challenges from a security perspective. While rail-air interconnectivity improves operational efficiencies at an airport, it may also increase the attractiveness of the airport as a target for terrorism, as well as expose the airport to new vulnerabilities introduced with the rail station.

According to the Federal Bureau of Investigation (FBI), it is highly likely that a terrorist attack will be directed against a U.S. airline, aircraft, airport, or passenger terminal in the next decade. Explosive devices, smuggled aboard planes in baggage or as part of on-board equipment or catering, remain the biggest threat to the aviation system. The FBI also views hijackings, shoulder-fired missiles, and the use of chemical, biological and nuclear weapons as significant threats that must be addressed. To date, the U.S. Intelligence Community is tracking more than 100 groups identified as having the capabilities to target U.S. aircraft, airports, and rail transit agencies.

To address these threats, the FAA is continuing its implementation of recommendations issued by the *White House Commission on Aviation Safety and Security and U.S. DOT policies specified as a result of Presidential Decision Directives (PDDs) 62 and 63.* These recommendations place a priority on the identification and resolution of vulnerabilities associated with the air transportation systems, including existing and future rail transportation interfaces with airports.

On July 17, 2001, FAA released in new Final Rules for 14 CFR Parts 107, 108, and 139 in the *Federal Register*. On July 21, 2001, the FAA released its updated Final Rules outlining security requirements for airport, air carriers, and tenants at airports, including rail transit stations and operations. The regulations apply to all U.S. airports that have a security program certified by FAA, including the 35 airports with existing or planned rail-aviation passenger terminals.

With this revision, FAA is initiating its most ambitious security program yet. Drafted over the last five years, these new Rules clearly define the areas of the airport in which security is the most critical and specify detailed requirements for access control, security identification and display areas and procedures, background checks on employees, and formal and documented security programs, certifications, and plans. These Rules also provide perhaps the most detailed and publicly-available discussion of the terrorist threat to aviation and the rationale behind the measures required by FAA to mitigate it.

Airport operators and tenants, including rail transit agencies serving the airport, are required by the new Rules to have a security program approved by the FAA Administrator that specifies measures they will use to perform their regulatory and statutory responsibilities. Airports and tenants will be held accountable for implementation of these measures through a rigorous inspection and enforcement program managed by FAA. Not only can FAA fine airports and tenants for failure to comply with security requirements, but individual employees are now directly accountable for non-compliance with certain regulations and can also be fined.

To fulfill FAA security requirements, as well as to address its own unique vulnerabilities, the rail transit agency serving the airport must develop a security program for the intermodal facility. Previous experience demonstrates that a dedicated security function, with the technical capabilities and resources to interface with planners, engineers, vendors, contractors, and airport and FAA personnel, most effectively manages this process during station planning, design and construction.

Security Requirements for Rail Terminals Serving Airports

Airport operators are required by the new Part 107.101 to have a security program, approved by the FAA Administrator, that specifies measures they will use to perform their regulatory and statutory responsibilities for security. Most airport security programs include the following information: descriptions of the air operations area (AOA), each area on or adjacent to the airport that affects the security of the AOA, and air carrier exclusive areas; procedures to control access to the AOA; alternate security procedures for use in emergency and other unusual conditions; and law enforcement support training and record maintenance programs in furtherance of part 107. Programs for some airports include a description of the law enforcement support training program and the system for maintaining records. New Part 107 requirements also detail airport, air carrier, and tenant obligations to manage the Security Identification Display Area (SIDA), to assure that only authorized personnel have access to critical and restricted areas and to perform background checks on employees and contractors.

The new Part 107.113 requires each airport tenant to develop a written security program, to be approved by the FAA. In this program, the tenant, including rail transit agencies, must assume responsibility for specified security systems, measures, or procedures of the secured area, AOA, or SIDA as provided in new Parts 107.201, 107.203, and 107.205. The tenant must assume the responsibility within the tenant's leased areas or areas designated for the tenant's exclusive use. The airport tenant security program must be in writing, signed by the airport operator and the airport tenant, and maintained in the larger airport security program. The airport tenant security program must include the following:

> (1) A description and a map of the boundaries and pertinent features of each area over which the airport tenant will exercise security responsibilities.
>
> (2) A description of the systems, measures, and procedures the airport tenant has assumed.

(3) Systems, measures, and procedures by which the airport operator will monitor and audit the tenant's compliance with the security program.

(4) Monetary and other penalties to which the tenant may be subject if it fails to carry out the airport tenant security program.

(5) Circumstances under which the airport operator will terminate the airport tenant security program for cause.

(6) A provision acknowledging that the tenant is subject to inspection by the Administrator in accordance with Sec. 107.7.

(7) A provision acknowledging that individuals who carry out the tenant security program are contracted to or acting for the airport operator and are required to protect sensitive information

(8) Procedures by which the tenant will immediately notify the airport operator of and provide for alternative security measures for changed conditions

Many of these requirements are familiar to rail transit operations coordinating with airports regarding the planning and design of intermodal stations. After all, security measures have been required to protect the AOA since the inception of Part 107 in 1972. These requirements have emphasized activities to be performed by the airport operator to control access to the AOA and prevent entry of unauthorized persons and ground vehicles; to control movement of persons and ground vehicles, including display of ID when appropriate; and to detect and control each unauthorized penetration.

The concept of the “secured area” was introduced in 1989 in Part 107.14, which requires enhanced access controls for secured areas of the airport mostly using computerized access controls. This area for most airports has evolved to be mainly portions of the AOA near the terminal and in baggage make-up areas, where the highest levels of security are needed. For some airports, the entire AOA is a secured area, because of such factors as the location of the airport and the inability to use adequate security controls to separate general aviation and other areas from air carrier operations.

The SIDA was defined in 1991, and has been re-defined in the new Rules as ``any area identified in the airport security program as requiring each person to continuously display on their outermost garment, an airport-approved ID medium unless under airport-approved escort." The ID medium is referred to as being used for both access control and controlling the presence and movement of persons. The portions of the airport that must be a SIDA are not set out in current part 107. FAA generally intends this area to include secured areas, air operations areas, cargo and baggage make-up areas, and other areas specified in individual airport security programs. SIDA would not include the sterile area.

To address these requirements, at a minimum, a rail transit station serving the airport environment must be designed to:

- Provide for the safety and security of rail transit patrons, while, at the same time, protecting the airport's facilities from incidents that may occur in the transit station

- Comply with FAA regulations governing access to the air operations area (AOA), restricted and secure area, Security Identification Display Areas (SIDAs), "sterile" terminals (at heightened threat levels), and emergency preparedness and planning

- Address fire safety, ventilation, and access/egress codes, regulations and requirements while ensuring the integrity of both the AOA and the "sterile" terminal

- Provide the airport with the capability to maintain continuous operation in the event of a major safety/security incident at the rail transit station

- Address jurisdictional and coordination issues between the airport and the rail transit system

Two major issues will take priority in intermodal facility planning, design, and operation:

- **Physical proximity of the two modes of transportation**. Rail transit stations may share a perimeter with the Air Operations Area or access to key building control systems, such as ventilation ducts, heating and cooling systems, electrical systems, or fire/life safety panels. Congressional legislation passed since 1991 encourages greater integration in intermodal facilities and multi-use design. Such close proximity between rail stations and airport terminals and critical systems requires special attention to planning and design to resolve shared security issues. Designs must be developed that limit the risk to the airport due to the presence of the rail station. The rail system must not be used as a conduit to transport explosives in close proximity to the airport or as a convenient escape for persons committing crimes on airport property.

- **Coordination of personnel and procedures among those parties responsible for security**. While domestic airports may be owned and operated by a variety of municipalities and governmental authorities, they remain subject to federal regulation. All aviation activities are licensed, certificated, or supervised by the FAA, and any activity that affects passenger safety and security is clearly within its purview. FAA sets guidelines and establishes procedures for security. However, airport security, though mandated by congressional legislation and administered by the FAA, is implemented by overlapping local police and private sector companies for operation. More often than not, sworn airport police officers patrol roadways, parking facilities and common areas of the terminals; private security personnel secure entry to concourses where the gates are situated, and the airlines themselves are responsible for their ticket counters and gate areas. Rail transit agencies, technically **tenants** of the airport, are responsible for meeting FAA and airport security requirements in a role analogous to the air carrier.

PART III: Rail/Aviation Interface Security Recommendations

To develop a security program for an intermodal station at the airport, the rail transit agency– as part of its preliminary engineering activities, must devise a comprehensive approach to facility security which answers the following seven questions:

1. How communication between the rail agency, FAA, airlines, and airports can be formalized and consistent to ensure effective terminal security management
2. How to "blend" people, programs and technology to achieve effective and reliable security
3. How to solve one of the biggest security and capacity issues by using off-airport baggage check-in and acceptance
4. The impact of design layout on airport security (particularly important for utilities and right-of-way acquisition)
5. Budget forecasting for security: how to make the most of available funds and how to appropriate additional money when necessary
6. How to ensure that rail transit, airport and FAA personnel understand each of their roles in the security program
7. How to support compliance with FAA inspection and enforcement programs and procedures

Strategies for Addressing Concerns

To meet FAA requirements and fulfill the demands of an exacting security planning process, the rail transit agency must establish a dedicated function to develop and execute the terminal's security program. The dedicated function must have the technical capabilities, resources, and authority to implement the security program and shepherd its development through the design and engineering process. In many cases, this dedicated function may be the rail transit agency police department supported by the transit safety and engineering departments. In other instances, a contractor or committee designated by the Project Manager may perform this role, in close coordination with the transit police or security department.

A sound security program for the rail aviation passenger terminal will be the result of detailed advance planning. All facilities have varying degrees of vulnerability to identified security hazards. The degree of risk from each specific hazard depends upon such variables as the type of facility or area involved, value or criticality, physical layout and protective measures which have been previously established. It does not appear that it is economically feasible or physically possible to establish the same degree of protection for all facilities. The degree of protection warranted is dictated by its criticality and relative vulnerability, and qualified by the effect of the protective measures on its operational effectiveness.

To make these determinations for the intermodal facility, the dedicated security function must initiate its activities early in the planning process to identify all involved parties and to arrange a *Working Group* or other forum to support:

- Collection of input from all involved parties, in order to identify potential security vulnerabilities created by the intermodal station project

- Identification and evaluation of counter-measures to address security vulnerabilities created by the intermodal station project and to improve overall security levels

- Development design criteria for each vulnerability, requirement and physical feature identified

- Development of Security Program and written plan, as specified in the new Part 107.113

In addition, the Working Group or other organization must review the *Advisory Circular* released by FAA to support implementation of new Part 107 and 139 requirements. This Circular will provide recommendations for establishing and improving security for restricted or critical facilities and areas. The Circular is expected to describe minimum acceptable standards for (a) preparation of a master security plan, (b) establishing and maintaining a suitable authorized persons identification program, and (c) establishing and maintaining an adequate identification system for certain ground vehicles. It also makes recommendations concerning conducting an airport security survey, establishing security committees, security education for airport personnel, the proper use of law enforcement personnel and liaison with appropriate law enforcement agencies and FAA Air Transportation Security Field Offices. Finally, the Circular will offer detailed recommendations on security technology, equipment and applications which reflect FAA's understanding of the requirements necessary to ensure the security of airport operations.

The designated security function and Working Group should also take advantage of the airport's *Security Consortium* – established at every major U.S. airport to bring airport, FAA, airline, and tenant personnel together to discuss major security issues and resolve on-going concerns.

Intermodal Station System Security Program Plan

The first step toward achievement of adequate protection at the airport station, compliant with new Part 107 requirements, is to develop a System Security Program Plan (SSP) for the facility. The purpose of the SSP is to establish and implement a proactive, prevention-oriented system security program to protect transit and airport customers, employees, and property. The SSP defines the security roles of each person and department, details their functions, and documents milestones in the development and implementation of the program. As indicated in the Sample Table below, the SPP can also define key security goals and objectives for the agency, and describes the policies, procedures, and programs developed to meet them.

A sample outline of an SSP follows the Table.

SAMPLE: TRANSIT POLICE DEPARTMENT OBJECTIVES FOR INTERMODAL STATION

Overall Objective: Prevent crime at the intermodal station by making the most efficient use of the staff; implementing innovative methods of transit policing; and building customer's confidence by increasing officer visibility.

Reduce criminal incidents occurring on the system.

- Deploy the Special Operations Response Team (SORT) in response to increased criminal activity.
- Deploy uniformed officers in a highly visible manner during peak system hours.

Utilize more effective methods for identifying and analyzing patterns of criminal activity on the system.

- Use information supplied by the Police Management Information Systems to make informed, efficient deployment decisions for uniformed and SORT personnel.

Maximize efficiency and effectiveness in all parts of the Department.

- Increase efficiency and effectiveness by refining all policies and procedures through the processes of national accreditation and State certification, and by relating that process to all Department Employees.

Increase the public's knowledge of the mission and efforts of the Police Department.

Encourage good community relations throughout all levels of the Department

Encourage good relations with other organizations and agencies at the airport.

- Provide customers and employees with an efficient, courteous, and helpful staff.
- Continue training Department personnel in human relations skills, including Customer Service classes for all personnel.

Promote an environment that will maintain the patronage of current customers and attract new system users.

- Continue to emphasize the Authority's customer service focus throughout the Department.

Develop a Security Breach Review Committee whose goal is the investigation of security breaches to identify causes with hopes of improving security by addressing those causes

- Staff the Security Breach Review Committee with appropriate employees.
- Provide support to committee in terms of time and equipment to perform tasks.
- Maintain an information system to log all security breaches so that appropriate analysis and decisions can be effectively made.
- Maintain a record keeping system that would log incidents by date, location, type, and disposition.
- The system should be available for on-line entry of all data.

Create a data system that would have a query capability so that users can ask questions such as how many incidences of fare evasion occurred during a specific time period at specific facilities.

- Display the current year, along with comparable statistics for a similar time frame, in tabular or graphical form

SAMPLE SSP TABLE OF CONTENTS

SIGNED POLICY STATEMENT (indicating management commitment to rail system security and authority for System Security Plan and Program, endorsed by senior management)

1.0 INTRODUCTION TO SYSTEM SECURITY FOR INTERMODAL STATION

- 1.1 Purpose of Intermodal Station System Security Plan (SSP)
- 1.2 Security Program Goals, Objectives and Tasks
- 1.3 Scope of the Security Program
- 1.4 Security and Law Enforcement Personnel
- 1.5 Management Authority and Legal Aspects
- 1.6 Coordination with Airport Security Program
- 1.6 Government Funding and Requirements
- 1.7 Definitions

2.0 STATION DESCRIPTION

- 2.1 Background and History
- 2.2 Organizational Structure for Operations
- 2.3 Human Resources
- 2.4 Passengers
- 2.5 Transit Services/Operations
- 2.6 Airport Services/Operations
- 2.7 Stations Facilities and Equipment
- 2.8 Security Capabilities and Practices

3.0 ACCESS CONTROL PROGRAM

- 3.1 Applicability
  - 3.1.1 Station areas providing access to Air Operations Area (AOA)
  - 3.1.2 Station areas providing access to airport Security Identification Display Areas (SIDAs)
  - 3.1.3 Station areas providing access to airport exclusive areas
  - 3.1.4 Station areas providing access to airport secured areas
  - 3.1.5 Station areas providing access to airport restricted areas
  - 3.1.6 Critical station operations that could impact the airport's ability to provide service
  - 3.1.7 Shared utilities and support facilities and systems
- 3.2 Technology and Procedures
  - 3.2.1 Electronic Access Control Systems
  - 3.2.2 Employee Identification Badges
  - 3.2.3 Closed Circuit Television
  - 3.2.4 Intrusion Detection
  - 3.2.5 Security Identification Display Area (SIDA) Program and Procedures
  - 3.2.6 Response to Alarms
  - 3.2.7 Procedures for Challenges to Unautorized Personnel
  - 3.2.8 Security Program for Contractors and Maintenance Personnel

3.0 SSP MANAGEMENT

- 3.1 Responsibility for Mission Statement and System Security Policy
- 3.2 Program Management
- 3.3 Security Responsibilities
  - 3.3.1 Police Department
  - 3.3.2 Other Divisions/Departments
  - 3.3.3 Committees
- 3.4 Security Breach Review

4.0 SSP ROLES AND RESPONSIBILITIES

- 4.1 Planning
- 4.2 Proactive Measures
- 4.3 Training
- 4.4 Day-to-Day Activities

5.0 THREAT AND VULNERABILITY MANAGEMENT

- 5.1 Identification
  - 5.1.1 Security Testing and Inspection
  - 5.1.2 Data Collection
  - 5.1.3 Reports
  - 5.1.4 Security Information Flow
- 5.2 Assessment
  - 5.2.1 Responsibility
  - 5.2.2 Data Analysis
  - 5.2.3 Probability and Severity
- 5.3 Resolution
  - 5.3.1 Emergency Response
  - 5.3.2 Breach Investigation
  - 5.3.3 Research and Improvements
  - 5.3.4 Eliminate, Mitigate, or Accept

6.0 SSP IMPLEMENTATION AND EVALUATION

- 6.1 Implementation Goals and Objectives
- 6.2 Implementation Schedule
- 6.3 Evaluation
  - 6.3.1 Internal Review - Management
  - 6.3.2 External Audits

7.0 SSP MODIFICATIONS

- 7.1 Initiation
- 7.2 Review Process
- 7.3 Implementation

APPENDICES

Risk Assessment

The next step in designing the security program is the performance of a detailed ***risk assessment*** of all areas, facilities and operations proposed for the intermodal facility. The assessment should evaluate the existing safeguards and procedures in use by both the rail transit agency and airport for adequacy, as well as indicating potential or actual security deficiencies or hazards. The risk assessment is the recommended basis from which to develop a plan to provide for adequate safeguards, which can deny unauthorized personnel access to restricted or critical facilities and areas.

As such, the risk assessment must effectively identify vulnerabilities at the rail-aviation passenger terminal and recommend security features, equipment, and facilities to resolve and control identified vulnerabilities. These recommendations will be used to guide security specifications for meeting FAA requirements, strengthening emergency response features, and contributing to the development of a set of design criteria governing the rail agency's access to the Airport. A comprehensive risk assessment allows the engineers and architects to address all possible safety and security issues.

Risk-assessment processes require the definition and inventory of systems and the processes they support; an assessment of potential vulnerability and threat; a decision to act or not; evaluation of the effectiveness of the action; and communication about decisions made. Once these steps are completed, the process should be repeated on a regular basis to ensure that the decisions made and controls implemented remain effective in reducing risk and meeting business needs and goals. For a rail station serving an airport, the risk assessment has the following steps:

STEP 1: Management Approval, Planning, and Preparation

Rail transit management is ultimately responsible for the transit operation being assessed, and for compliance with FAA requirements. As such, top managers must approve the implementation of the threat and vulnerability analysis process. That approval should initiate formal planning and the drafting of an *Execution Plan*, which identifies team members (who will conduct the analysis), work scope (what will be analyzed), data requirements (what information must be obtained), methodology (how required data will be gathered – interviews, records review), schedule, logistics, and cost. Management should be briefed on the Execution Plan and have the opportunity to provide their input.

STEP 2: Identification of Critical Assets Requiring Protection

Critical assets, and the essential elements that are associated with them, must be identified and assessed as to their importance. Critical assets include people, activities/operations, information, facilities, and equipment. Assets for a heavy rail system may include stations, rail cars, track, signal systems, rail yards, command control center, and revenue collection facilities. Asset identification provides the essential starting point for the risk analysis methodology. Critical assets are identified primarily through interviews with asset managers, using structured interview guides, data reviews, and variety of other sources.

STEP 3: Identify Asset Criticality.

Asset criticality refers to an assessment performed to determine which assets have the most impact on people (passengers and employees) and the system (ability to maintain service). This assessment makes it possible to identify those assets that are most important to the rail transit system, and therefore must be protected. In general, critical assets for the three rail modes of service include passenger stations, track, signal systems, and rail cars. Critical assets for bus systems include bus terminals, bus vehicles, and fuel storage facilities.

STEP 4: Identify Threats to Critical Assets.

This step requires the identification of specific threats from criminal activity to critical transit assets, where threat is defined as any real or potential condition that can cause injury or death to passengers or employees or damage to or loss of critical assets. Threats are identified using both historical (trend) analysis of all attacks committed against public transportation targets and a survey of transit security professionals that clarifies expert opinion concerning the most serious threats to public transportation. Many transit agencies conduct a thorough review of incident reports to identify past threats, including type of incident, location of incident, and final disposition of incident. Threats may organized by category (criminal offense) or location (station, rail vehicles, etc.) The Table below presents a typical listing of crimes to occur on a rail transit agency. Such a listing is a useful starting place for threat identification

STEP 5: Develop Threat Scenarios.

In this step, the critical assets identified in Step 3 and the key threats identified in Step 4 are paired into scenarios to focus analytical activities. This activity provides for a representative a range of criminal activity, and allows for detailed analysis concerning the likely impacts of threats on critical assets. Some threats (such as graffiti or public drunkenness) can be easily assessed; while others (such as hostage situations, sabotage, or terrorism) require a more detailed evaluation.

ABC TRANSIT -- HISTORY OF SECURITY BREACHES

Type of Breach	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Assault, Aggravated(1)	92	89	83	40	71	158
Bomb Threats	0	1	0	3	6	16
Computer Database Intrusions	0	0	0	0	0	0
Disorderly Conduct	349	413	383	199	232	1681
Drug Abuse (employees)	0	0	0	0	0	0
Drug Sales	4	0	1	8	1	0
Exhibitionism	96	116	93	22	17	35
Fare Evasion	440	467	379	303	509	1567
Forgery	0	0	0	1	0	5
Fraud	435	277	272	215	439	221
Lewdness	0	0	0	0	0	130
Rape	4	1	3	0	1	1
Robbery, Armed	78	93	59	53	55	70
Robbery, By Force(2)	74	62	58	73	91	65
Stock/Part Shrinkage(3)	0	0	0	0	0	0
Solicitation	0	0	0	0	1	0
Terrorism	0	0	0	0	0	0
Theft	616	478	611	611	1,083	638
Trespassing	61	36	30	40	99	162
Vandalism (4)	616	531	527	494	610	509

STEP 6: Assess Consequences of Threat Scenarios.

During this step, the costs and impacts of the threat scenarios are specified using a standard risk level matrix, which supports the organization of consequences into categories of "unacceptable -- must be controlled or eliminated," "unacceptable – but management may determine to accept risk," and "acceptable with management review." Consequences are assessed both in terms of financial loss (determined by human loss and injury, loss of asset, replacement/recovery costs, and congestion/delay) and using expert opinion to evaluate a series of criteria that determine probability of loss and impact of loss for a given threat scenario.

The purpose of this step is to gain a quantitative understanding of which scenarios present the transit agency with the highest impact consequences. In this way, transit agencies can make appropriate decisions on resource allocation using data that objectively describes vulnerabilities. The mechanism used to categorize the consequences of the scenarios is the risk assessment matrix shown below. Each of the scenarios will be evaluated, based on prescribed measures, and classified according to severity and probability.

STEP 7: Prioritize Public Transportation Vulnerabilities and Countermeasures

This step requires the prioritization of public transportation vulnerabilities based on the results of Step 6. Vulnerability refers to any condition or act that endangers human life or property. The identification of vulnerabilities is the major goal of this analysis process. These vulnerabilities must then be addressed with countermeasures that mitigate their causes and effects. Based on expert opinion and key findings from research and evaluation, this step involves the identification and development of countermeasures to address the prioritized vulnerabilities. Countermeasures may include police and security deployment and staffing alternatives, security technology, environmental design and review, and security materials selection and analysis. Wherever possible, industry standards should be used to identify countermeasures that address prioritized vulnerabilities.

STEP 8: Audit of Implemented Countermeasures

This step involves reviews to determine if implemented recommendations have had their desired effect and not created new, unforeseen vulnerabilities.

Based on the results of the risk assessment, the Working Group or other organization established to address the security program may arrive at a list of concerns, such as the following:

Terrorism

- ✓ Blast attenuation (ability of rail station to "blow off" bomb blast from train, protecting airport terminal); blast analysis; structural integrity of rail/aviation interface
- ✓ Isolation of airport from CBN release on surface platform or train (detection, ventilation, physical barriers)
- ✓ Capability for remote sterilization of passengers and trains (equipment requirements, conduits, personnel) and planning for passenger congestion
- ✓ Appropriate distance of train nose from AOA and key airport facilities, including formalized FAA sign-off on this distance
- ✓ Rail airside interface (identification of requirements to protect airside from threats on rail platform and formalized FAA sign-off on dimensions of rail airside overhang)
- ✓ Coordinated emergency planning and response capabilities

- ✓ Requirements for checkpoints/equipment at surface/aviation interface
- ✓ Equipment requirements for rail third-party baggage checking (positive passenger baggage match, x-ray machines, metal detectors, passenger queuing space)
- ✓ Feasibility of and physical requirements for rail off-site baggage check-in
- ✓ Joint data collection and crime prevention operations

Accidents and Emergencies

- ✓ Fire/life safety of rail equipment/facility on airport property
- ✓ Ability to maintain continuous airside operation in the event of a rail accident/incident
- ✓ Jointly developed response planning for accidents and emergencies

In addition, it can be helpful for the security Working Group or other forum for addressing security to identify their "Top Ten" Security Concerns and "Top Ten" Security Mistakes. These lists, such as the ones below, provide the entire project team with straight-forward and easily accessible "guidance" regarding basic security philosophies for the intermodal passenger terminal.

"Top Ten" Security Concerns

1. Baggage-handling and Management
2. Access Control
3. Designation of SIDA and Secured Areas
4. Workplace Violence
5. Convenience and By-pass Avoidance
6. Training for Guards and Tenants
7. Screening of Employees
8. Accountability and Record-keeping
9. Understanding Airport Needs
10. Contingency Planning

"Top Ten" Security Mistakes

1. Using Technology to Solve All Security Problems
2. A Security Manager with a Bad Attitude
3. Buying Into the Low Bid Concept
4. Improper Use of CCTV
5. Going it Alone
6. Ignoring the Facility's Culture
7. Inconsistent Perimeters
8. Ignoring the Basics of Security
9. Not Revisiting the Security Plan Regularly
10. Failing to Budget for Long-Term Planning

To address identified concerns, at a minimum, the rail station design should consider:

- Electronic Access Control
- Closed Circuit Television
- Procedural Access Control
- Contingency Planning
- Strategies for Managing Criminal Activity
- Baggage Check-in Facilities

Each of these issues is addressed briefly below.

Electronic Access Control. Federal regulations (FAR 107.14) require that airports implement an access control system (ACS) to guarantee that only authorized personnel have access to airside operations and facilities. These regulations also require that airport tenants, with access to the AOA or to facilities or equipment that could disrupt air operations if used in an unauthorized manner, be protected with the airport's ACS. In order to comply with these requirements, transit stations at airports must generally make accommodations for the airport's ACS in their final design plans.

There are three types of access points, defined by Federal regulations and utilized by the most airports: ***secure, mission-critical, and restricted.***

> ***Secure access points*** refer to those doorways and openings that connect directly with the Airside Operations Area (AOA).
>
> ***Mission-critical access points*** include all those doorways and openings that connect to facilities/equipment that do not border on the AOA, but that have (or could have) an impact airport operations.
>
> ***Restricted access points*** refer to those openings that do not border on the airside and that do not connect to mission-critical locations, but that are still within airport property.

Connection to the airport's ACS is only required at secure and mission-critical access points. Restricted access points may use simple lock and key mechanisms to provide security or may utilize other systems implemented at the discretion of the airport tenant. These systems do not need to be connected to the airport's ACS. In reality, most transit facilities, platform, and mezzanine offer no direct access to the Air Operations Area; no doors or other openings that could provide entry into FAR 107.14 locations. However, some transit facilities do contain equipment and controls that could have an impact on airport operations, if accessed by unauthorized personnel.

Types of ACS used at airport varies, ranging from advanced computer and electrical equipment supported by fault tolerant software, consisting of swipe card readers/PIN entry systems and biometric identification devices, controlled through a distributed database, to simple PIN activated locks installed at all airside access points along the Security Identification Display Area (SIDA, or the area where airport employees must display badges coded for different levels of access).

ACS can be integrated with the airport's CCTV Local Area Network (LAN) system, the Airport's Communications Center, the Airport's Computer Aided Dispatch (CAD) software, and the Airport's Emergency Operations Center (EOC) to provide the quickest possible response to any breech, as well as a video recording of the incident for use as evidence and to aid in investigation and training. In addition, the ACS can be connected to an alarm control system, which would utilize bond sensors to remotely monitor the status of all locks on restricted doors. An unlocked door would immediately be relayed to the Airport's Comm Center CAD system for priority response.

Construction requirements for the ACS are minor in nature: fiber optic cable must be connected to the nearest hub for tie-in to the Airport database and camera surveillance system, remote power sources must be located for each ACS door, and space must be allocated for the installation of the swipe card readers or other devices near each ACS door. Baggage shafts and access grates would need to be alarmed with cable feeds directly into the Airport's ACS system.

Integration of CCTV Surveillance Systems

Like the recommended ACS, the CCTV system to support security requirements can vary in sophistication and expense. Systems are now available which make use of a distributional system that connects all CCTV cameras through a Local Area Network (LAN) so that any location on the LAN can access real-time video from any camera on the network. Signals are transmitted to the LAN over fiber optic cables. This system can be connected directly to the Airport's ACS system, the Airport's Comm. Center, and the Airport's Emergency Operations Control (EOC). The CCTV surveillance system could allow a dispatcher at a remote console to assess a given situation and dispatch the appropriate personnel to any incident. In an emergency situation, multiple officers can be informed of the situation by CCTV assessment. Video tape can also be recorded off any camera on the LAN.

Utilizing a LAN system with an architecture of hubs on a flexible backbone, cameras can be easily added to this surveillance system though the connection of fiber optic cable to the nearest hub (typically a few hundred feet). Transmission of the video from hubs to any monitor on the system will be handled by the LAN. This technology has been proven for copper-based, broadband LANs and is rapidly evolving with the same features using broadband on fiber optics. All current problems with the existing LAN/ACS interface have been identified, and the use of broadband on fiber optics has been recommended to improve switching capabilities; to reduce the heat generated at points of relay; and to increase the speed of camera response to real-time requests.

In order to assess how rail transit facility camera surveillance systems should be connected to the Airport LAN, the *number*, *type*, and *location* of cameras throughout the platform and facilities must be identified. The number of cameras will be affected by the number of mission-critical access points identified at the rail facility, as these points require cameras on both side of access doors and openings.

Procedural Access Control. Access by transit employees, vendors, and contractors to the AOA and ramp areas should be carefully controlled, limiting access to those areas for which the individual has been cleared, based on a need to be in those locations to support transit operations. Every transit employee at the station should be issued an airport identification card and should be fingerprinted, undergo a criminal background check, and be issued only that level of clearance necessary to carry out his or her employment and consistent with an approved level of security. Persons with unrestricted access to aircraft, passengers, passenger baggage and cargo should be permitted access only upon passing an appropriate criminal background check.

Transit employees should be screened through appropriate metal detectors or other equipment before being granted access to restricted areas of the airport. These employees should not be allowed to report directly to their time-clocks and locker areas through back gates or entrances under the terminal. In some instances doors are locked and entry is granted by punching in a code number provided for employees. Such a system allows not only multiple exits and entries throughout the day, but also for the carrying of uninspected parcels as well.

Transit agencies must institute similar provisions for controlling their vendors and outside maintenance personnel. Vendors must not gain access to the ramp side of airports without undergoing either a personal background check or a search of their vehicles. For random visits by vendors, temporary identification should be required and such visitors should be supervised at all times.

A formal system must be established for identification and control of all authorized persons, and should be included in a written document that includes the following criteria as applicable:

(a) Designated areas where identification is required.
(b) Type of identification media to be utilized and issuing authority.
(c) Procedure for checking identification of personnel.
(d) Details of where, when, and how identification media should be worn or carried.
(e) Disposition of lost or damaged media.
(f) Termination of access authorization (transfers, terminations or suspensions, etc.).
(g) Production and control of identification media.
(h) Designated points of entry to controlled areas.
(i) Job title of individuals who have authority to issue identification media and/or grant access to controlled areas. (These individuals should be strictly limited.)

Contingency Planning. Response to ***accidents and emergencies*** at rail/aviation interfaces is complicated by the dual nature of the intermodal facility. Train accidents and derailments must be responded to in a quick and effective manner, with minimal impact on aviation operations. In

the event of a major incident at the airport, rail transit operations must remain flexible to support response, to limit or suspend service, or to implement emergency plans and protocols.

Federal Aviation Regulation Parts 107, 108, and 139 require airport operators and certificate holders to adopt and carry out security, safety, and preparedness plans and programs which provide for the safety of persons and property traveling in air transportation. These authorizations include requirements for aircraft rescue and firefighting response, hazardous materials incident planning, medical assistance, structural fire plans, and programs that provide for safety against criminal acts. Rail operations at airports must be incorporated into these plans and programs.

In order to respond to heightened security conditions and emergency alerts at airports, rail transit agencies must also develop plans for suspending or re-routing service. When such diversions are necessary, rail transit agencies may choose to re-route trains to another station, and operate only dedicated and "sterile" trains between this station and the airport.

Criminal Activity. Rail transit stations in airports may also provide for enhanced criminal mobility, encouraging certain types of criminal activity (such as baggage theft and pickpocketing) by providing criminals with increased opportunities to commit crimes and to leave the scene quickly. According to transportation crime analysts Henry DeGeneste and John Sullivan, intermodal facilities, particularly the joining of rail stations with other modes of transportation, provide changing and perhaps increasing opportunities for criminal activity. "The diverse nature of terminal users along with the potential high crowd density provide unique challenges to the police responsible for maintaining public peace. Unfortunately, this activity and the central location of many transportation terminals have the potential to make these vital facilities a loci for crime and disorder."[1]

Over the last decade, airport crime has come to typify a category of criminal activity centered on theft: baggage theft; phone and credit card theft and fraud; laptop, cellular phone, and camera theft; and pickpocketing. While these crimes are relatively minor in nature, they can have serious consequences for the victims. In addition, the random nature of these crimes makes them especially difficult for police to solve.

Phone and credit card theft and fraud is another growing problem in airports. Criminals, posing as tourists, may use video cameras to record people entering their codes into phones and cash machines. This technique is referred to as "shoulder surfing." Then, these criminals will use these numbers for their personal benefit. This type of crime can be very difficult to identify. Major transit facilities, such as the New York Port Authority Bus Terminal, have also experienced this type of crime.

Another significant problem for both airports and transit is laptop theft. Criminals at airports and on rail transit systems have developed many different techniques for distracting passengers carrying laptop computers and then taking the laptops. In many cases, criminals work in teams

[1] Henry DeGeneste and John Sullivan, Policing Transportation Facilities (Springfield, IL: Charles C. Thomas Publishing), 1994, pg. 115.

to carry out this activity. Cameras, cellular phones, purses and wallets are also highly attractive targets for criminals at airports.

Baggage Check-in Facilities

To improve passenger convenience and to create a seamless intermodal connection between rapid transit and air transportation, check-in areas for domestic baggage should be considered at the intermodal terminal. However, creating a strategy to deal with the problem of baggage is a challenge for all involved in the design and operation of the intermodal facility. Baggage-handling strategies remain one of the most controversial aspects of intermodal facility planning. To structure baggage check-in sites on platforms requires commitment of space, equipment, and most significantly, air carrier cooperation. This process is currently managed by each airline individually, at their counter or curbsides. Space limitations on a rail platform necessitate a combined approach. Unfortunately, sharing check-in and even ticketing services runs counter to air carrier operating philosophies and capabilities.

However, for those intermodal stations serving airport dominated by a single airline, check-in sites should be investigated. In addition, the rail transit agency should be sure to include appropriate physical provisions for baggage inspection stations – as this activity, required by FAA in a soon-to-be-released Final Rule, would have to be performed prior to the passenger's entry into the airport (at least some element). Determining the exact specifications for these inspection stations is difficult. The screening process currently recommended by FAA is rigorous, and requires expensive equipment and considerable physical space. Ultimately, since rail transit providers are not in the baggage handling business, these requirements may prove prohibitive to true intermodal objectives for these terminals.

However, the success of these facilities in Europe and Asia warrants their consideration in the intermodal planning process. To evaluate this possibility, it is recommended that the dedicated security function form a working group to resolve operational and security issues related to the baggage check-in areas. At a minimum, to plan for future capacity, a full set of specifications on the equipment proposed for the baggage screening process should be delivered to the transit agency engineers and architects who, working with airport personnel, can identify an appropriate space to be roughed-in on the design schematics. Including this space in design will save a substantial sum of money if this feature is ever added to the intermodal terminal.

Conclusion

The unique intermodal context of rail/aviation interfaces presents a number of security concerns. Not only must the rail facility protect patrons and employees from crime and safety hazards, it must also offer protection to the airport terminal and AOA from the most serious of criminal incidents: terrorist attacks, sabotage, and hijacking. In addition to the safety and security concerns inherent to each mode of transport, procedural and jurisdictional issues present unique challenges to respective officials. The proper coordination of management responsibilities is paramount among these challenges: officials from both transportation modes share an over-riding concern with the safety and security of airport and transit assets, passengers, and employees.